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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Serial No.: 10/576,404

Filed: April 20, 2006

Based on: PCT/EP2004/052189

Title: **Extrusion Process for the Preparation
of Toughness-Modified and Layered
Silicate-Reinforced Thermoplastic Systems**

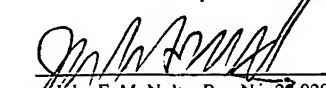
Inventor(s): Jozsefne Karger-Kocsis and Tapio Harmia

Priority Date
Claimed: October 20, 2003

Docket No.: 080-06

Certificate of Mailing

I hereby certify that this correspondence is
being deposited with the United States Postal
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Patents, P.O. Box 1450, Alexandria VA
22313-1450, on September 14, 2006


John F. McNulty, Reg No. 23,028
Dated: September 14, 2006

COVER LETTER WITH CERTIFICATE OF MAILING

Commissioner for Patents
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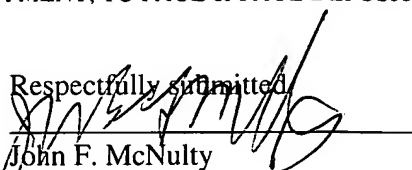
Dear Sir:

Enclosed and attached hereto are the following documents:

- (1) Cover Letter with Certificate of Mailing;
- (2) International Preliminary Examination Report on Patentability (7 pages); and
- (3) Paul & Paul Postcard to be returned by the PTO.

THERE IS NO FEE BELIEVED TO BE REQUIRED HOWEVER, THE COMMISSIONER IS
HEREBY AUTHORIZED TO CHARGE ANY ADDITIONAL FEES ASSOCIATED WITH THIS
COMMUNICATION, OR CREDIT ANY OVERPAYMENT, TO PAUL & PAUL DEPOSIT ACCOUNT NO.
16-0750, ORDER NO. 4232

Respectfully submitted,


John F. McNulty

Reg. No. 23,028

Paul & Paul

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From the INTERNATIONAL BUREAU

PCT

NOTIFICATION OF TRANSMITTAL
OF COPIES OF TRANSLATION
OF THE INTERNATIONAL PRELIMINARY REPORT
ON PATENTABILITY
(CHAPTER I OR CHAPTER II
OF THE PATENT COOPERATION TREATY)
(PCT Rules 44bis.3(c) and 72.2)

To:

WEBER, Dieter
Weber, Seiffert, Lieke
Postfach 61 45
65051 Wiesbaden
ALLEMAGNE

Dr. Weber, K. Seiffert, Dr. Lieke

17. Aug. 2006

Termin:

Date of mailing (day/month/year)

03 August 2006 (03.08.2006)

Applicant's or agent's file reference
FACT 10301WO

IMPORTANT NOTIFICATION

International application No.
PCT/EP2004/052189International filing date (day/month/year)
15 September 2004 (15.09.2004)

Applicant

FACT FUTURE ADVANCED COMPOSITES & TECHNOLOGY GMBH et al

1. Transmittal of the translation to the applicant.



The International Bureau transmits herewith a copy of the English translation of the international preliminary report on patentability (Chapter I).



The International Bureau transmits herewith a copy of the English translation of the international preliminary report on patentability (Chapter II).

2. Transmittal of the copy of the translation to the designated or elected Offices.

The International Bureau notifies the applicant that copies of that translation have been transmitted to the following designated or elected Offices requiring such translation:

None

The following designated or elected Offices, having waived the requirement for such a transmittal at this time, will receive copies of that translation from the International Bureau only upon their request:

AE, AG, AL, AM, AP, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DK, DM, DZ, EA, EC, EE, EG, EP, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NI, NO, NZ, OA, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW

3. Reminder regarding translation into (one of) the official language(s) of the elected Office(s).

The applicant is reminded that, where a translation of the international application must be furnished to an elected Office, that translation must contain a translation of any annexes to the international preliminary report on patentability (Chapter II).

It is the applicant's responsibility to prepare and furnish such translation directly to each elected Office concerned within the applicable time limit (Rule 74.1). See Volume II of the PCT Applicant's Guide for further details.

The International Bureau of WIPO
34, chemin des Colombettes
1211 Geneva 20, Switzerland

Authorized officer

Yolaine Cussac

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PATENT COOPERATION TREATY

PCT

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY (Chapter I of the Patent Cooperation Treaty)

(PCT Rule 44bis)

Applicant's or agent's file reference FACT 10301WO	FOR FURTHER ACTION	See item 4 below
International application No. PCT/EP2004/052189	International filing date (<i>day/month/year</i>) 15 September 2004 (15.09.2004)	Priority date (<i>day/month/year</i>) 20 October 2003 (20.10.2003)
International Patent Classification (8th edition unless older edition indicated) See relevant information in Form PCT/ISA/237		
Applicant FACT FUTURE ADVANCED COMPOSITES & TECHNOLOGY GMBH		

1. This international preliminary report on patentability (Chapter I) is issued by the International Bureau on behalf of the International Searching Authority under Rule 44 bis.1(a).

2. This REPORT consists of a total of 6 sheets, including this cover sheet.

In the attached sheets, any reference to the written opinion of the International Searching Authority should be read as a reference to the international preliminary report on patentability (Chapter I) instead.

3. This report contains indications relating to the following items:

- | | | |
|-------------------------------------|--------------|---|
| <input checked="" type="checkbox"/> | Box No. I | Basis of the report |
| <input checked="" type="checkbox"/> | Box No. II | Priority |
| <input type="checkbox"/> | Box No. III | Non-establishment of opinion with regard to novelty, inventive step and industrial applicability |
| <input type="checkbox"/> | Box No. IV | Lack of unity of invention |
| <input checked="" type="checkbox"/> | Box No. V | Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement |
| <input type="checkbox"/> | Box No. VI | Certain documents cited |
| <input type="checkbox"/> | Box No. VII | Certain defects in the international application |
| <input type="checkbox"/> | Box No. VIII | Certain observations on the international application |

4. The International Bureau will communicate this report to designated Offices in accordance with Rules 44bis.3(c) and 93bis.1 but not, except where the applicant makes an express request under Article 23(2), before the expiration of 30 months from the priority date (Rule 44bis .2).

Date of issuance of this report
27 July 2006 (27.07.2006)

Authorized officer

Yolaine Cussac

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PATENT COOPERATION TREATY

From the
INTERNATIONAL SEARCHING AUTHORITY

PCT

Translation

WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY

(PCT Rule 43bis.1)

To:

Date of mailing **See Form PCT/ISA/210**
(day/month/year) **(sheet 2)**

Applicant's or agent's file reference
FACT 10301WO

FOR FURTHER ACTION

See paragraph 2 below

International application No.
PCT/EP2004/052189

International filing date (day/month/year)
15.09.2004

Priority date (day/month/year)
20.10.2003

International Patent Classification (IPC) or both national classification and IPC
C08J3/205, C08K3/34, B29C47/10

Applicant

FACT FUTURE ADVANCED COMPOSITES & TECHNOLOGY GMBH

1. This opinion contains indications relating to the following items:

- ☒ Box No. I Basis of the opinion
- ☒ Box No. II Priority
- ☐ Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- ☐ Box No. IV Lack of unity of invention
- ☒ Box No. V Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- ☐ Box No. VI Certain documents cited
- ☐ Box No. VII Certain defects in the international application
- ☐ Box No. VIII Certain observations on the international application

2. **FURTHER ACTION**

If a demand for international preliminary examination is made, this opinion will be considered to be a written opinion of the International Preliminary Examining Authority ("IPEA") except that this does not apply where the applicant chooses an Authority other than this one to be the IPEA and the chosen IPEA has notified the International Bureau under Rule 66.1bis(b) that written opinions of this International Searching Authority will not be so considered.

If this opinion is, as provided above, considered to be a written opinion of the IPEA, the applicant is invited to submit to the IPEA a written reply together, where appropriate, with amendments, before the expiration of 3 months from the date of mailing of Form PCT/ISA/220 or before the expiration of 22 months from the priority date, whichever expires later.

For further options, see Form PCT/ISA/220.

3. For further details, see notes to Form PCT/ISA/220.

Name and mailing address of the ISA/EP

Authorized officer

Facsimile No.

Telephone No.

WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY

International application No.

PCT/EP2004/052189

Box No. I Basis of this opinion

1. With regard to the language, this opinion has been established on the basis of the international application in the language in which it was filed, unless otherwise indicated under this item.

☐

This opinion has been established on the basis of a translation from the original language into the following language

_____, which is the language of a translation furnished for the purposes of international search (under Rule 12.3 and 23.1(b)).

2. With regard to any nucleotide and/or amino acid sequence disclosed in the international application and necessary to the claimed invention, this opinion has been established on the basis of:

a. type of material

☐

a sequence listing

☐

table(s) related to the sequence listing

b. format of material

☐

in written format

☐

in computer readable form

c. time of filing/furnishing

☐

contained in the international application as filed.

☐

filed together with the international application in computer readable form.

☐

furnished subsequently to this Authority for the purposes of search.

3. ☐ In addition, in the case that more than one version or copy of a sequence listing and/or table(s) relating thereto has been filed or furnished, the required statements that the information in the subsequent or additional copies is identical to that in the application as filed or does not go beyond the application as filed, as appropriate, were furnished.

4. Additional comments:

WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY

International application No.

PCT/EP2004/052189

Box No. II

Priority

1. ☒ The following document has not yet been furnished:

- ☒ copy of the earlier application whose priority has been claimed (Rule 43bis.1 and 66.7(a)).
☐ translation of the earlier application whose priority has been claimed (Rule 43bis.1 and 66.7(b)).

Consequently it has not been possible to consider the validity of the priority claim. This opinion has nevertheless been established on the assumption that the relevant date in the claimed priority date.

2. ☐ This opinion has been established as if no priority had been claimed due to the fact that the priority claim has been found invalid (Rules 43bis.1 and 64.1). Thus for the purposes of this opinion, the international filing date indicated above is considered to be the relevant date.
3. Additional observations, if necessary:

**WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY**

International application No.

PCT/EP2004/052189

Box No. V

Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability:
citations and explanations supporting such statement

1. Statement

Novelty (N)

Claims 1-15

YES

Claims _____

NO

Inventive step (IS)

Claims _____

YES

Claims 1-15

NO

Industrial applicability (IA)

Claims 1-15

YES

Claims _____

NO

2. Citations and explanations:

Reference is made to the following documents:

D1: DE 198 54 170

D2: FR 1 384 652

D1 relates to thermoplastic nanocomposite materials which have improved mechanical and process-technology properties, in particular excellent stiffness together with excellent toughness. The thermoplastic nanocomposite materials according to D1 preferably comprise:

- A) from 10 to 99.89% by weight of a thermoplastic;
- B) from 0.01 to 15% by weight of at least one naturally occurring or synthetic phyllosilicate;
- C) from 0.1 to 15% by weight of a rubber or rubber mixtures, i.e. of a toughness modifier according to the present application.

The particle size distribution of the fine-particle rubber or of the rubber mixtures has a d(50) value of from 0.01 to 1.0 μm (see D1, page 2, lines 16-56; page 3, lines 28-30). A typical particle structure of the preferred multiphase rubbers of D1 is a core with one or more shells (see page 5, lines 4-5).

In one preferred embodiment of D1, thermoplastic

WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY

International application No.

PCT/EP2004/052189

Box No. V

Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability;
citations and explanations supporting such statement

nanocomposite materials can be obtained by using extrusion to mix the thermoplastic, the phyllosilicate and the rubber or rubber mixtures. Component C can be added (see page 7, lines 45-55) in the form of an emulsion (latex).

The difference between the process according to D1 and the process of the present claims is that both toughness modifier and phyllosilicate are introduced in essentially aqueous dispersion into the system to be compounded, and that, during the extrusion process, the water is at least to some extent removed from the system to be compounded.

The problem addressed by the application appears to be provision of a process which leads to thermoplastic systems with improved distribution of toughness modifier and phyllosilicate.

However, the solution according to the claims consists in introducing the toughness modifier and the phyllosilicate in aqueous dispersion into the system to be compounded and is previously known from D2. Said document discloses that homogeneous distribution of the following additives is achieved (see D2, page 1-2) using mixing to incorporate additives such as fillers or rubber into the melt of thermoplastics, in an extruder. The subject matter of the claims does not therefore involve an inventive step.